

**Fakultät für Mathematik, Informatik und Physik
Universität Innsbruck**

**Ankündigung des öffentlichen Vortrags
(„defensio dissertationis“)**

im Rahmen der abschließenden kommissionellen Prüfung (Rigorosum)
im Doktoratsstudium der Naturwissenschaften Physik

von

Michael Schuler, BSc MSc

über

**“Energy Spectroscopy of Quantum Critical Points and
Non-Equilibrium Dynamics of a Quantum Simulator”**

Zeit: Freitag, 01. März 2019, 15.30 Uhr

Ort: Seminarraum 1, ICT Gebäude, Technik

Inhalt:

Quantum critical points (QCP) as the transition points between distinct phases of matter are an ever exciting topic in condensed matter physics and in quantum field theories alike. They show universal properties such that microscopically different models behave identically at their critical points when they are within the same universality class. A surprisingly little explored aspect of QCPs is their finite volume spectrum on numerically easily accessible geometries, such as a 2D spatial torus. In this talk I will show that the finite-size torus energy-spectrum of QCPs provides a universal fingerprint of the underlying quantum field theory and can be utilized to characterize and identify the corresponding universality class. I will also demonstrate its potential to identify confinement-deconfinement transitions and advocate a phenomenological picture that provides insight into the operator content of the quantum field theory.

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